XPress Ethernet Bridge™

Product Manual - Commercial / Indoor XEB09-C
Create long range wireless links in minutes!

Connect any Ethernet device to the XPress Ethernet Bridge RF Modems and the bridge will function in place of an Ethernet cable. The Ethernet bridge provides a transparent wireless point-to-point cable replacement.

www.maxstream.net
© 2006 MaxStream, Inc. All rights reserved.
M100257

Introduction

This manual provides step-by-step instruction on how to setup a wireless link and test the Ethernet Bridge's ability to transport data over varying ranges and conditions.

Included with the XPress Ethernet Bridge (Commercial)

(2) XPress Ethernet Bridge RF Modems
(2) 6 VDC/80-240 VAC power adapters (not included w/ version XEB09-C-AU (Australia))
(2) Half-wave, 2.5 dBi, dipole antennas w/RPTNC connector

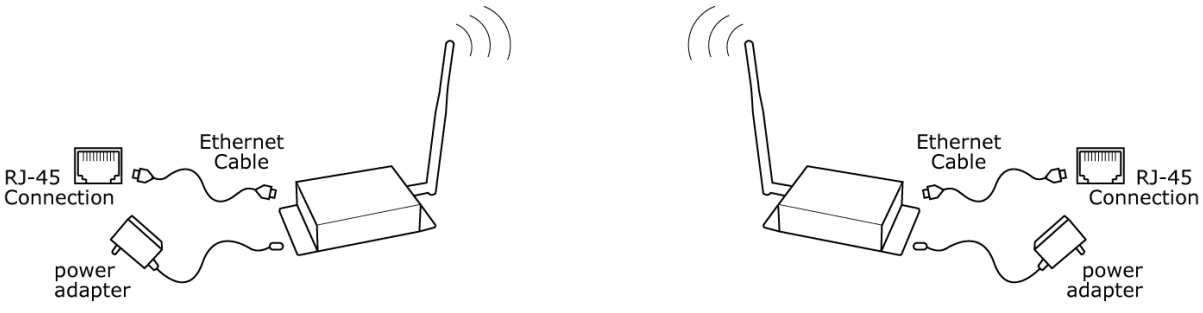
Quick Setup

Hardware Setup

1. Plug both RF Modems into power outlets using the included power adaptors. (If operating in Australia: Use power adapters that meet Australian regulations and the supply voltage specifications cited on page 4 this manual.)
2. Connect an Ethernet cable from each XPress RF Modem to a network device.
3. Send Ethernet traffic through the wireless Ethernet Bridge [for troubleshooting, refer to the following page].

Each RF Modem automatically selects the best radio channel, encrypts the Ethernet traffic and transports the data wirelessly to its matched pair. Cross-over cables are not necessary since the RF modems automatically sense the device (client vs. switch).

Figure 1. Ethernet Bridge Setup



LED Display

The XPress RF Modem has 16 LEDs that display the status of the device.

LED	Name	Function	Color
1	Power	Unit has power and has successfully booted.	Red
2	RF Link	RF modem has successfully linked with its partner.	Green
3	RF TX	Radio transmission is occurring.	Green
4	RF RX	Radio reception is occurring.	Green
5	Eth Link	Ethernet port has a valid Ethernet connection.	Green
6	Activity	RF modem is processing data.	Green
7	1 (channel)	To determine the current radio channel, add the numbers that are lit. 1 - 903 MHz 7 - 915 MHz 2 - 905 MHz 8 - 917 MHz 3 - 907 MHz 9 - 919 MHz 4 - 909 MHz 10 - 921 MHz 5 - 911 MHz 11 - 923 MHz 6 - 913 MHz 12 - 925 MHz	Green
8	2 (channel)		
9	4 (channel)		
10	8 (channel)		
11	Link Quality	Excellent link quality – No retransmissions	Green
12	Link Quality	Very good link quality – Few retransmissions	Green
13	Link Quality	Good link quality – Occasional retransmissions	Amber
14	Link Quality	Fair link quality – Some retransmissions	Amber
15	Link Quality	Weak link quality – Many retransmissions	Red
16	Link Quality	No link quality - No link available	Red

Troubleshooting

No Power LED:
Check the power connections.

No Radio Link LED:
The radio is looking for its matched partner. If both units are powered up and the Power LEDs are active they may be too far away to create the radio connection. Try other locations that may have a less obstructed path or try to reorient the antennas.

Yagi-type antennas get their best range when they are both oriented to point directly at each other with the antenna elements oriented in the same plane (e.g. vertically or horizontally).

Radio Link LED on but Quality Indicator is low:
The units may be too far away to create a good radio connection. Try other locations that may have a less obstructed path or try to reorient the antennas.

No Ethernet Link LED:
Check your network connections.

Still not working?
If practical, temporarily use an Ethernet cable to see if the network is working over a wired connection. If a wire does not work then the problem is with the network.

PRODUCT LIMITED WARRANTY:
This product is warranted to the original purchaser for normal use for a period of 30 days from the date of purchase. If a defect covered under this warranty occurs, MaxStream will repair or replace the defective part, at its option, at no cost. This warranty does not cover defects resulting from misuse or modification of the product.

Advanced Settings

Automatic Frequency Selection Mode (All DIP Switches OFF (up))
<Default Configuration> The RF modem is designed to automatically select and continuously optimize the performance of its radio channel. The radio channel is monitored to ensure it is providing low error rates necessary for successful radio transmission. In the event that the error rate rises, the RF modem will autonomously change to a new channel. There are 12 non-overlapping channels.

Figure 2. DIP Switches - Automatic Frequency Selection Mode (All OFF (up))

Australia only: In order to comply with Australian regulations, all modems intended for use in Australia are pre-configured to operate on 6 channels and DIP Switches are disabled.

Manual Frequency Selection Mode
To restrict the operation of the RF modem to a subset of the 902-928 band, the user may activate a manual selection mode that allows the radio to automatically choose the best channel within a grouped subset of the 12 available channels. This is enabled by the 8-position DIP switch on the master unit. These settings allow the RF modem to operate on the optimal channel in one of three subsets: LOW 4, MID 4 or HIGH 4.

Channels	Frequency Range	DIP Settings
LOW 4 - 1,2,3 or 4	903-909 MHz	2 ON / 3 OFF
MID 4 - 5,6,7 or 8	911-917 MHz	2 OFF / 3 ON
HIGH 4 - 9,10,11 or 12	919-925 MHz	2 ON / 3 ON

Or - the user may wish to select a specific channel. This can be done by setting DIP switches 5-8 as shown in the table below. [Turn DIP 2 Off / 3 Off]

Channel	Frequency	DIP Settings
1	903 MHz	5 On / 6 Off / 7 Off / 8 Off
2	905 MHz	5 Off / 6 On / 7 Off / 8 Off
3	907 MHz	5 On / 6 On / 7 Off / 8 Off
4	909 MHz	5 Off / 6 Off / 7 On / 8 Off
5	911 MHz	5 On / 6 Off / 7 On / 8 Off
6	913 MHz	5 Off / 6 On / 7 On / 8 Off
7	915 MHz	5 On / 6 On / 7 On / 8 Off
8	917 MHz	5 Off / 6 Off / 7 Off / 8 On
9	919 MHz	5 On / 6 Off / 7 Off / 8 On
10	921 MHz	5 Off / 6 On / 7 Off / 8 On
11	923 MHz	5 On / 6 On / 7 Off / 8 On
12	925 MHz	5 Off / 6 Off / 7 On / 8 On

Site Survey Mode (DIP Switch 4 is ON (down))
In this mode the RF modem can perform a site survey. With this mode activated the radios send and receive at 100% capacity by transceiving self-generated simulated data. The installer can monitor the Link Quality display to assess channel quality while optimizing antennae orientation. The installer can manually select each channel to evaluate performance and identify the best channels for operation. By identifying channels with poor performance it is possible to identify possible interferers and use "Manual Frequency Selection Mode" to avoid portions of the band or select a fixed operating frequency.

Important Note: Ethernet traffic does not get transported while the RF modems are in Site Survey Mode.

Technical Specifications

Specification	Description
Power Output	125 mW (21 dBm) conducted, 4 Watts EIRP w/ 15 dBi antenna
RF Data Rate	1.5 Mbps
Throughput Data Rate	935 Kbps
Receiver Sensitivity	-97 dBm @10e^{-4} BER (-112 dBm w/ 15 dBi antennas)
Latency	< 1ms - assuming a dedicated wireless link to client device
Jitter	±0.5 ms - depending upon packet size, interference and SNR
Radio channels	12 Non-overlapping
Automatic frequency select	Yes - radio channel automatically selected and adaptively optimized
Manual frequency mode	Yes
Status LEDs	Power, RF Link, Ethernet Link, Traffic, RF RX, RF TX, 4/Channel and 6/Link Quality
Error-correction technique	Sub-block error-detection and retransmission
Adjacent band rejection	SAW receiver filter attenuates cellular and pager interference
Transmit current consumption	350 mA
PoE (Power over Ethernet)	Proprietary 9V system - includes injectors and power supplies
Supply Voltage (Temperature Range)	4.5 - 9.0 VDC (for -40 °- 70° C) up to 16.0 VDC (for -40° - 35° C)
United States (FCC part 15.247)	R4N-AW900M
Industry Canada (IC)	5303A-AW900M

FCC Compliance

Compliance Statement (Part 15.19)
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Warning (Part 15.21)
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

RF Exposure (OET Bulletin 65)
To comply with FCC RF exposure requirements for mobile transmitting devices, this transmitter should only be used or installed at locations where there is at least 20 cm separation distance between the antenna and all persons.

Information to the User - Part 15.105 (b)
Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
--Reorient or relocate the receiving antenna.
--Increase the separation between the equipment and receiver.
--Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
--Consult the dealer or an experienced radio/TV technician for help.

This product should be installed ONLY by experienced, professional installers who are familiar with local building and safety codes, and wherever applicable, are licensed by the appropriate authorities. Failure to do so may void the warranty and may expose the user or the service provider to legal and financial liabilities.

Contact MaxStream

Phone: **(801) 765-9885**
OnLine Chat: **www.maxstream.net**
e-mail: **rf-xperts@maxstream.net**